Remarks

Applicant has amended the Abstract and Title in response to Examiner's request. Applicant submits that the amended Abstract and Title are now in acceptable condition.

Claim Rejections – 35 U.S.C. § 112

Applicant has amended claim 10 in response to Examiner's request. Applicant submits that this claim as amended meets the requirements of 35 U.S.C. § 112.

Claim Rejections – 35 U.S.C. § 102

Examiner has rejected claims 1-9 and 11-13 under 35 U.S.C. § 102(e) as being anticipated by Shibata et al. 2002/0164523. Applicant respectfully disagrees with the Examiner's rejection.

Claim 1 claims an anode-supported solid oxide fuel cell comprising an anode support layer having a porous ion-conducting structure with pores impregnated with a catalytic and electronically conductive material. Nothing in *Shibata* discloses or suggests such an anode support layer structure. In particular, *Shibata et al.* discloses a porous metallic base body but does not disclose that the pores of the base body are impregnated with anything. *Shibata et al* merely discloses that the base body may be made with nickel and/ or ceramic. While such a base body may contain a catalytic or electronically conductive material, its structure is very different ~~than the~~ anode-support layer as claimed in the present application. In *Shibata et al*, the nickel and/or ceramic material is integrally formed into the base body; therefore one would expect a cross-sectional micrograph ~~of the base body~~ to reveal a structure with a porous homogenous composition. In contrast, a micrograph of an anode-support layer

change any "et al" to -- et al. -- (italicize all instances too; add period)

as presently claimed will reveal a porous structure (for example, YSZ) having at least some of the pores filled with a catalytic and electronically conductive material (for example, nickel, copper, silver, tungsten). In other words, the anode-support layer has a non-homogenous structure. Applicant therefore submits that claim 1 is not anticipated by *Shibata et al.*

As claims 2 to 11 are dependent on claim 1, Applicant further submits that the traversal of claim 1 overcomes any 35 U.S.C. § 102(e) rejection to the dependent claims.

Claim 12 claims an anode-supported solid oxide fuel cell comprising an anode support layer comprising an ion-conducting structure with a plurality of vias extending through the thickness of the ion-conducting structure, with at least some of the vias being filled with electronically conductive material. Nothing in *Shibata* discloses or suggests such an anode support layer structure. In particular, *Shibata* does not disclose the existence of vias, or channels, that span the thickness of the anode support layer. *Shibata et al* discloses that gas passes through the anode support layer, which Examiner interprets to mean that the anode support layer must have vias. Even it this were true, the structure of the anode support layer presently claimed in claim 12 would still be very different than the anode-support layer disclosed in *Shibata et al*. *Shibata et al* discloses a "porous metallic base body" which may be made with nickel and/or ceramic; there is no disclosure of any vias that are filled with electronically conductive material. Therefore, one would expect a cross-sectional micrograph of the base body described in *Shibata et al* to reveal a porous base body comprising a homogenous composition. In contrast, a cross sectional micrograph of an anode support layer as presently claimed in claim 12 will reveal a non-homogeneous porous structure comprising a base structure with vias extending through the thickness of the ion-conducting structure and at least some of the vias filled with electronically conductive material. Applicant therefore submits that claim 12 is not anticipated by *Shibata et al.*

Further, nothing in *Shibata et al* discloses or suggests a fuel cell as claimed in claim 13 of the present application. In particular, Example 1 in *Shibata et al* merely discloses a fuel cell having a pair of electrodes 10, 11 sandwiching an electrolyte 12 and supported by metallic base bodies 1 and 2. There is no disclosure or suggestion of a buffer layer. Even if one could characterize electrode 10 as being an anode functional layer, and one of the surface layers of the porous base body 1 as being a buffer layer, there is no disclosure of the buffer layer as claimed in claim 13. While Example 1 discloses an electrode 10 having a nickel-zirconia composition, the porous base body 1 is made of a different material. Paragraph 69 of *Shibata et al* discloses the porous base body 1 to include a "ceramic (alumina) body plated with Ni"; the table shown in Figures 10(a) and (b) disclose various compositions for the porous base body 1, including "aluminum with Ni", "sintered body of metallic grains", and "sintered body of metallic fibers". There is no disclosure of the buffer layer as claimed in claim 13, i.e. a porous cermet buffer layer in adjacent intimate contact with the anode support layer and composed of zirconia-nickel cermet with a porosity between 40 and 90%. Therefore, Applicant submits that claim 13 is not anticipated by *Shibata et al.*

Claim Rejections – 35 USC § 103

The Examiner rejects claims 7, 8 and 10 under 35 U.S.C. § 103(a) as being obvious in view of *Shibata et al* and Sammes et al 2002/0028367.

As discussed above, nothing in *Shibata et al* discloses or suggests an anode support layer having pores impregnated with a catalytic and electronically conductive material; such anode support layer is claimed in claims 7, 8, and 10. *Sammes et al* describes anode layers that comprise different ratios of electrochemically active substance. *Sammes et al* also describes a process for manufacturing a solid oxide fuel cell anode wherein YSZ powder is added to NiO powder and these materials are milled, extruded, dried and sintered together. As

discussed above, one would expect a cross-sectional micrograph of the base body described in *Sammes et al* to reveal a porous structure comprising a homogenous composition within each layer. There is no suggestion in *Sammes et al* to impregnate catalytic and electronically conductive material into the pores of an anode support layer, thereby creating an anode support layer having a non-homogeneous porous structure. Therefore, Applicant submits that claims 7 and 10 are non-obvious in view of *Shibata et al* and *Sammes et al*.

The Applicant respectfully submits that the above-identified application is now in a condition for allowance and favourable reconsideration and allowance of these claims are respectfully requested.

Respectfully submitted,

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